

## ABSTRACT

The invention is directed to a laser ultrasound testing system with adaptive generation of sonic energy signals. The system may detect or test features of the manufactured object such as defects and layer properties. A laser generator initiates a sonic energy signal in a manufactured object. A measuring device measures the sonic energy signal. Then, a signal analyzer and/or a model processor determine if the signal is optimized. If the signal is not optimized, optimized operating characteristics of the laser generator are calculated. These optimized operating characteristics may include wavelength, beam dimension, temporal profile and power. Next, the laser generator initiates an improved sonic energy signal by utilizing the optimized operating characteristics. In this manner, more accurate testing and detection is achieved.